

CLAIMS:

1. Full-jacket helical conveyor centrifuge (1), having
 - a) a rotatably disposed, metallic drum (2) with a horizontal axis of rotation,
 - b) at least one drive device for the drum (2),
 - c) a helical conveyor (3) which is rotatably disposed at a differential rotational speed with respect to the rotational speed of the drum (2) and which can be rotated by way of a gearing by means of the first drive device for the drum or by way of another device for the helical conveyor (6) (3?),
 characterized in that
 - d) at least the drive device for the drum (2) has at least one electromechanical direct drive (25a-f),
 - e) whose primary or secondary elements (26) are arranged directly at or on the drum (2) or at or on a part (6, 17, 18, 19, 20) non-rotatably connected with the drum (2),
 - f) and its corresponding secondary or primary elements (27) are arranged at a distance with respect to these without contact outside the drum (2) or the part (6, 17, 18, 19, 20) non-rotatably connected with the drum (2),
 - g) the propulsion force being able to be generated in a gearless manner by an electromagnetic field of travelling waves advancing around the drum (2) or around the part (6, 17, 18, 19, 20) non-rotatably connected with the drum (2).

2. Full-jacket helical conveyor centrifuge according to Claim 1, characterized in that the ratio between the inner axial dimension of the drum (2) and its inside diameter is greater than 1, particularly greater than 2.5.

3. Full-jacket helical conveyor centrifuge according to Claim 1 or 2, characterized in that the secondary elements (26) of the at least one direct drive (25a-f) are arranged on the outer periphery of the drum (2) or on the outer periphery of a part (6, 17, 18, 19, 20) non-rotatably connected with the drum (2), and the primary elements (27) are in each case arranged radially outside the secondary elements (26) at a distance from these without contact.

4. Full-jacket helical conveyor centrifuge according to one of the preceding claims, characterized in that the primary and/or the secondary elements (27) surround the drum (2) completely or in sections concentrically and are used for generating the field of travelling waves.

5. Full-jacket helical conveyor centrifuge according to one of the preceding claims, characterized in that the primary or secondary elements (27) are arranged on a ring disk projecting radially from the drum (2) or a part non-rotatably connected with the drum (2), which ring disk is non-rotatably connected with the drum (2)/ the part.

6. Full-jacket helical conveyor centrifuge according to one of the preceding claims, characterized in that the drive device for the drum (2) has several of the electronic direct drives (25a-f).

7. Full-jacket helical conveyor centrifuge according to one of the preceding claims, characterized in that at least one or more of the electronic drives (25a-f) is/are arranged on an attachment of the drum (2) as an axial extension of the drum (2).

8. Full-jacket helical conveyor centrifuge according to one of the preceding claims, characterized in that the cylindrical attachment (18, 19, 20) is arranged in the axial direction between the main bearings (15, 16).

9. Full-jacket helical conveyor centrifuge according to one of the preceding claims, characterized in that the cylindrical attachment (17) is arranged on the outer periphery of the conical section (2b) of the drum (2).

10. Full-jacket helical conveyor centrifuge according to one of the preceding claims, characterized in that the cylindrical attachment is a chamber (6) for receiving a centripetal pump (7).

11. Full-jacket helical conveyor centrifuge according to one of the preceding claims, characterized in that the primary elements (27) surround the drum in sections and the secondary elements (26) surround the drum completely.

12. Full-jacket helical conveyor centrifuge according to one of the preceding claims, characterized in that a plurality of successively controllable coils are distributed on the outer periphery of the drum as primary elements (27) for generating the field of travelling waves which travels around the drum and in the process takes along a plurality of the, in particular, permanent-magnetic secondary elements (26).

13. Full-jacket helical conveyor centrifuge according to one of the preceding claims, characterized in that the drum (2) has at least one play-free bearing (15, 16) around which or directly adjacent to which the respective electromagnetic direct drive is arranged.

14. Full-jacket helical conveyor centrifuge according to one of the preceding claims, characterized in that an additional co-rotating field of travelling waves motor generates the differential rotational speed between the helical conveyor and the drum.

15. Full-jacket helical conveyor centrifuge according to one of the preceding claims, characterized in that the drive device for the helical conveyor is constructed independently of the drive device for the drum.

16. Full-jacket helical conveyor centrifuge (1) having a horizontally rotatably disposed, metallic drum (2) and a rotatable helical conveyor (3) as well as having a drive device for the drum (2) and a drive device for the helical conveyor (3), characterized in that

- at least the drive device for the helical conveyor (3) has at least one electromechanical direct drive(s),
- whose primary or secondary elements (26) are arranged directly at or on a part (21) non-rotatably connected with the helical conveyor (3),
- and whose corresponding secondary or primary elements are arranged at a distance from these without contact outside this part,
- the propulsion force being generated in a gearless manner by an electromagnetic field of travelling waves advancing around the part non-rotatably connected with the helical conveyor.

17. Full-jacket helical conveyor centrifuge according to Claim 16, characterized in that the drive device for the drum (2) and the drive device for the helical conveyor (3) are designed as electromagnetic direct drive(s).

18. Full-jacket helical conveyor centrifuge according to Claim 17, characterized in that no gearing is arranged between the drum (2) and the helical conveyor (3).

19. Full-jacket helical conveyor centrifuge according to one of the preceding claims, characterized in that the rotational speed can be adjusted continuously.